

MULTI-YEAR RETURN ON INVESTMENT FIELD TRIAL

WHITEPAPER

YEAR 1: FARMING SMARTER

"How do I calculate Return-on-Investment for different fertilizer programs?"

Executive Summary

Results will help potential customers understand the economics of incorporating Replenish Nutrients products into their fertilizer program. Replenish Nutrients has partnered with Farming Smarter to provide a land commitment and execute the multi-year trial at their research plots in Brooks, Bow Island and Lethbridge on canola, wheat, and faba bean crops.



Case Study

This multi-year project will evaluate the Return-on-Investment (ROI) for Replenish Nutrients products in a crop rotation trial in Southern Alberta using crop growth, yield, and soil health testing to determine the effect of treatments. Crop yield data will be analyzed against current crop input and commodity prices to determine the potential ROI for growers in Alberta.

This trial is designed to understand the economic and environmental impact of replacing the synthetic form of phosphorus (P), potassium (K) and sulphur (S) with a sustainable alternative.

This third-party trial will test the economic effect of incorporating Replenish Nutrients products into an agricultural system. This information can then form the basis for the wider application of Replenish Nutrients products in other parts of Western Canada.



Are Higher Yields Better?

If increased yields return more money for a grower after the treatment costs are deducted, then yes. However, with fluctuating treatment costs, growers are forced to make purchasing decisions which might not result in a positive ROI. This trial is designed where the only variable in the trial design is that Replenish Nutrients products or synthetic fertilizer products provide the P, K & S requirements. Synthetic nitrogen (N) was standardized across all treatments.

Trial Design: Objectives

Growth & Yield	To determine the effect of product treatments on crop growth and yield. Multiple crop growth, tissue testing, and yield parameters will be measured, including stand density, plant height, days to maturity, grain yield, and quality.
Health Indicators	To determine the effect of the product treatments on soil health indicators. The effect of treatments on physical, chemical, and biological soil health parameters will be measured.
Return-on-Investment	Calculate customers' ROI based on their fertilizer program, yield data and current commodity prices.

Field Trial Details



Alberta Field Trial locations in Brooks, Bow Island and Lethbridge



Products tested on canola, wheat and fababean



ROI Calculation using actual fertilizer and commodity prices from 2022

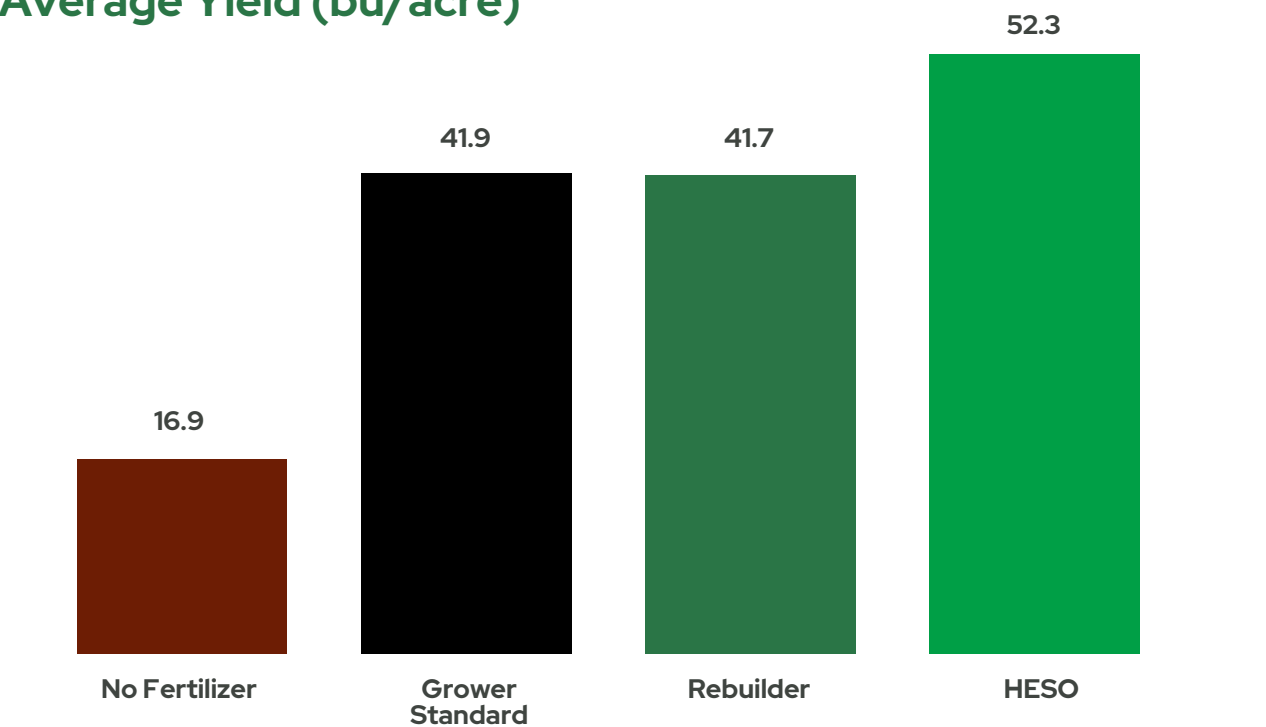


Soil sampling completed by **Down to Earth Lab** and **CARA Soil Health Lab**



Results: Canola in Brooks, AB

Average Yield (bu/acre)



The use of Rebuilder provided **equivalent yields** to the grower standard.

HESO provided a **yield improvement of 10.4** bushels per acre over the grower standard.

Table 1: Treatment Cost per Acre

Treatment	UREA 46-0-0	MAP 11-52-0	AMS 21-0-0-24	Rebuilder 0-17-0-12	HESO 0-9-20-20	Total	Price Difference vs. Grower Standard
No Fertilizer	0	0	0	0	0	0	-\$197.40
Grower Standard	\$163.14	\$11.10	\$23.15	\$0.00	\$0.00	\$197.40	-
Rebuilder	\$171.95	\$0.00	\$16.75	\$10.45	\$0.00	\$199.15	\$1.75
HESO	\$184.19	\$0.89	\$4.63	\$0.00	\$29.48	\$219.20	\$21.80

Note1: Baseline soil testing available nutrients: 6 lbs. N, 53 lbs P, 537 lbs. K and 11 lbs S

Note2: Each treatment received 174 lbs. N, 10 lbs. P, 0 lbs. K and 25 lbs. S



Return-on-Investment Calculation

The following factors should be evaluated when calculating ROI:

- Cost Per Acre: How much will switching from one product to another cost?
- Yield Per Acre: What was the effect of each treatment on crop growth and yield?
- Crop Value: Current commodity grain/crop price.
- Acres: Across how many acres will the treatment be used on?
- Years of Use: What is the product benefit after 1, 5, and 10 years?

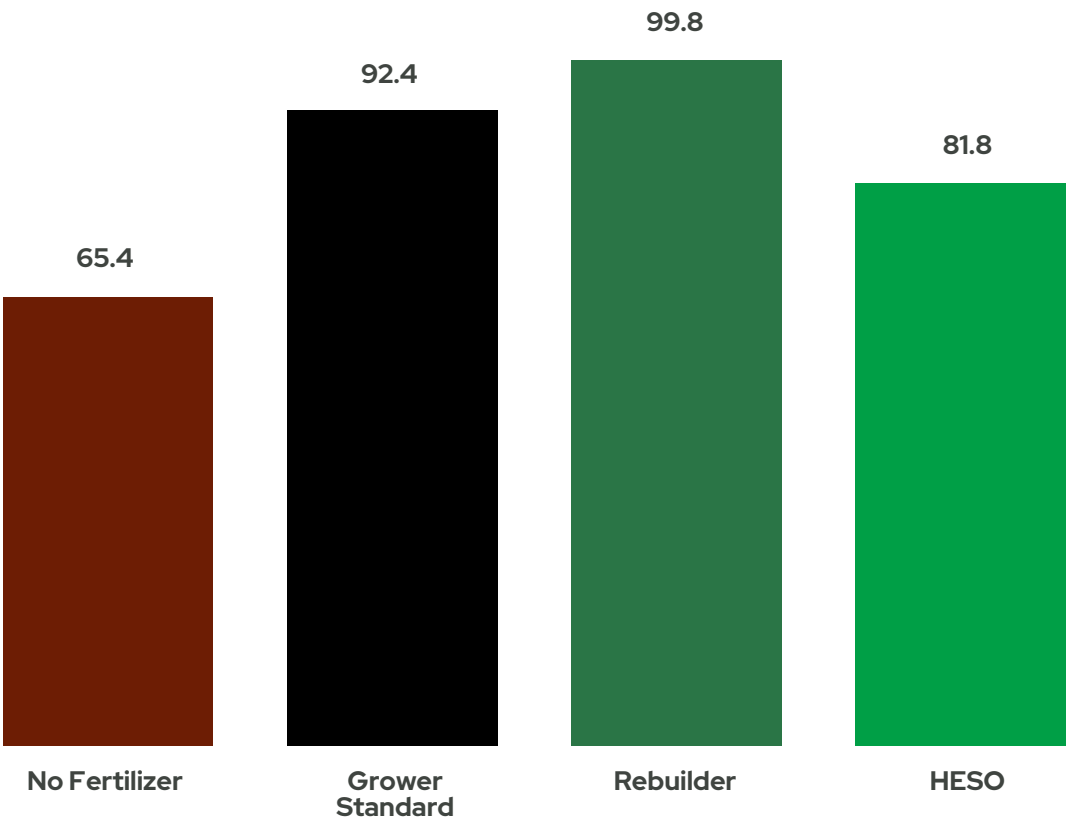
Table 2: Return-on-Investment Calculation - Canola in Brooks, AB

Assumption	No Fertilizer	Grower Standard	Rebuilder	HESO	Explanation
Treatment Cost/Acre	\$0	\$197.40	\$199.15	\$219.20	How much the treatments cost based on fertilizer market prices in May 2022.
Yield/Acre	16.9	41.9	41.7	52.3	Average yield data per treatment
Crop Spot Price/Bu	\$17.67	\$17.67	\$17.67	\$17.67	September 2022 Canola prices provided by PDQ.
Yield x Crop Spot Price/Bu	\$298.62	\$740.37	\$736.84	\$924.14	Crop spot price multiplied by bushel's produced
Additional Income	-	\$244.35	\$239.07	\$406.32	Fertilizer Type Income - Treatment Cost - No Fertilizer Income
ROI	-	123.79%	120.04%	185.36%	The percent of additional income gained from the treatment after recouping the treatment cost.
ROI VS GS	-23.78%	-	-3.74%	61.58%	ROI Comparison vs. Grower Standard



Results: Wheat in Lethbridge, AB

Average Yield (bu/acre)



The use of HESO did not provide equivalent yields to the grower standard.

Rebuilder provided a **yield improvement of 7.4** bushels per acre over the grower standard

Table 1: Treatment Cost per Acre

Treatment	UREA 46-0-0	MAP 11-52-0	AMS 21-0-0-24	Rebuilder 0-17-0-12	HESO 0-9-20-20	Total	Price Difference vs. Grower Standard
No Fertilizer	0	0	0	0	0	0	-\$189.09
Grower Standard	\$140.21	\$44.24	\$4.63	\$0.00	\$0.00	\$189.09	-
Rebuilder	\$153.91	\$0.00	\$0.00	\$41.64	\$0.00	\$195.55	\$6.46
HESO	\$147.02	\$34.04	\$0.00	\$0.00	\$29.48	\$210.54	\$21.46

Note1: Baseline soil testing available nutrients: 18 lbs. N, 14 lbs P, 560 lbs. K and 17 lbs S

Note2: Each treatment received 142 lbs. N, 39 lbs. P, 0 lbs. K and 5 lbs. S

Note3: The HESO treatment received an additional 20 lbs/acre of K. The other treatments did not receive any K.



Return-on-Investment Calculation

The following factors should be evaluated when calculating ROI:

- Cost Per Acre: How much will switching from one product to another cost?
- Yield Per Acre: What was the effect of each treatment on crop growth and yield?
- Crop Value: Current commodity grain/crop price.
- Acres: Across how many acres will the treatment be used on?
- Years of Use: What is the product benefit after 1, 5, and 10 years?

Table 2: Return-on-Investment Calculation - Wheat in Lethbridge, AB

Assumption	No Fertilizer	Grower Standard	Rebuilder	HESO	Explanation
Treatment Cost/Acre	\$0	\$189.09	\$195.55	\$210.54	How much the treatments cost based on fertilizer market prices in May 2022.
Yield/Acre	65.4	92.4	99.8	81.8	Average yield data per treatment
Crop Spot Price/Bu	\$9.90	\$9.90	\$9.90	\$9.90	July 2022 Wheat prices provided by Alberta Wheat Commission
Yield x Crop Spot Price/Bu	\$647.46	\$914.76	\$988.02	\$809.82	Crop spot price multiplied by bushel's produced
Additional Income	-	\$78.21	\$145.01	-\$48.18	Fertilizer Type Income – Treatment Cost – No Fertilizer Income
ROI	-	23.79%	74.15%	-22.88%	The percent of additional income gained from the treatment after recouping the treatment cost.
ROI VS GS	-23.79%	-	32.79%	-64.24%	ROI Comparison vs. Grower Standard





**“ From this year’s data, the
Replenish Nutrients products
appear to perform as well as the
standard fertilizers across the
crop growth factors. ”**

*"Our objective with this project is to identify if
incorporating Replenish Nutrients products into a
traditional fertilizer program can improve soil health
while still providing the plant with proper nutrients."*

Trevor Deering

Custom Research Team Lead
Farming Smarter



Conclusion

The first year of our multi-year project evaluating the Return-on-Investment (ROI) for Replenish Nutrients products has provided valuable insights for growers in southern Alberta.

In Canola, our Rebuilder formula demonstrated equivalent yields to the grower standard, highlighting its effectiveness. On the other hand, the HESO formula showcased a significant yield improvement of 10.4 bushels per acre, along with a remarkable 61% better ROI compared to the Grower Standard. These results underscore the economic benefits of using our products in Canola fields.

In Wheat, the Rebuilder formula delivered a yield increase of 7.4 bushels per acre, solidifying its positive impact on crop production. However, the HESO formula did not perform as well in terms of yield improvement. Nonetheless, the ROI calculation for Wheat revealed a 33% economic benefit over the grower standard. It is worth noting that the ROI calculation for HESO was skewed due to surplus potassium identified in the baseline soil analysis. Further analysis indicated that additional potassium was not necessary to achieve optimal crop growth, and the application of 20 lbs/acre in the HESO treatment did not yield any additional benefits due to the available phosphorus in the soil.

As for Faba Beans, the results from the first year were inconclusive, as all treatments, including the no fertilizer treatment, provided equivalent crop growth. Further investigation is required to draw definitive conclusions regarding the impact of treatments on Faba Bean production.

These findings highlight the importance of considering specific crop requirements, soil conditions, and existing nutrient levels when developing a fertility program. By carefully evaluating these factors, growers can make informed decisions and optimize their ROI. Moving forward, we are excited to receive soil health data following the 2024 growing season. We anticipate that these results will demonstrate quantifiable improvements in soil health, further validating the short-term ROI benefits and long-term soil health enhancements associated with transitioning to Replenish Nutrients products.



Get in Touch!



Send an email to
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Renew.
Revive.
Replenish.

